Abstract

A method and apparatus for decoding a linear block encoded string of information bits comprising: converting the string into a plurality of codewords. Performing hard and soft decisions on each codeword to generate a hard and soft decision vector. Computing the syndrome and finding the location of the two minimum values by Galois Field Arithmetic. Designating these values LOW1 and LOW2 and xoring with a Nc1, thus generating Nc2. Swapping Nc1 with Nc2 and determining the lowest soft decision value, Min1 and a next lowest value, Min2. The two bit locations creating Min1 are designated as MinA and MinB. MinA being replaced with Min2 minus the value MinA. MinB being replaced with Min2 minus the value at MinB. Generating an output codeword by subtracting Min1 from all other bit locations values and 2's complementing all soft values with 0 in their location. Creating the new soft value vector.